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An American National Standard

Standard Test Method for Performance of Conveyor Ovens[1]

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1. Scope

1.1 This test method covers an evaluation of the energy consumption and cooking performance of conveyor ovens. The food service operator can use this evaluation to select a conveyor oven and understand its energy consumption.

1.2 This test method is applicable to gas and electric conveyor ovens.

1.3 The conveyor oven can be evaluated with respect to the following (where applicable):

1.3.1 Energy input rate and thermostat calibration (see 10.2),

1.3.2 Preheat energy consumption and time (see 10.3),

1.3.3 Idle energy rate (see 10.4),

1.3.4 Pilot energy rate (if applicable) (see 10.5), and

1.3.5 Cooking energy efficiency and production capacity (see 10.6).

1.4 The values stated in inch-pound units are to be regarded as the standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASHRAE Documents:*

ASHRAE Handbook of Fundamentals, "Thermal and Related Properties of Food and Food Materials," Chapter 30, Table 1, 1989[2]

ASHRAE Guideline 2-1986 (RA90) Engineering Analysis of Experimental Data[2]

3. Terminology

3.1 *Definitions:*

3.1.1 *conveyor oven*, *n*—an appliance that carries the food product on a moving conveyor into and through a heated chamber. The chamber may be heated by gas or electric forced convection, radiants, or quartz tubes. Top and bottom heat may be independently controlled.

3.1.2 *cooking energy efficiency*, *n*—quantity of energy imparted to the specified food product, expressed as a percentage of energy consumed by the conveyor oven during the cooking event.

3.1.3 *cooking energy rate*, *n*—average rate of energy consumption (Btu/h or kW) during the cooking energy efficiency tests. Refers to all loading scenarios (heavy, medium, light).

3.1.4 *energy input rate*, *n*—peak rate at which a conveyor oven consumes energy (Btu/h or kW).

3.1.5 *idle energy rate*, *n*—the conveyor oven's rate of energy consumption (kW or Btu/h), when empty, required to maintain its cavity temperature at the specified thermostat set point.

3.1.6 *oven cavity*, *n*—that portion of the conveyor oven in which food products are heated or cooked.

3.1.7 *pilot energy rate*, *n*—rate of energy consumption (Btu/h) by a conveyor oven's continuous pilot (if applicable).

3.1.8 *preheat energy*, *n*—amount of energy consumed (Btu or kWh), by the conveyor oven while preheating its cavity from ambient temperature to the specified thermostat set point.

3.1.9 *preheat time*, *n*—time (min.) required for the conveyor oven cavity to preheat from ambient temperature to the specified thermostat set point.

3.1.10 *production capacity*, *n*—maximum rate (lb/h) at which a conveyor oven can bring the specified food product to a specified "cooked" condition.

3.1.11 *production rate*, *n*—rate (lb/h) at which a conveyor oven brings the specified food product to a specified" cooked" condition. Does not necessarily refer to maximum rate. Production rate varies with the amount of food being cooked.

3.1.12 *uncertainty*, *n*—measure of systematic and precision errors in specified instrumentation or measure of repeatability of a reported test result.

4. Summary of Test Method

4.1 Accuracy of the conveyor oven thermostat is checked at a setting of 475°F and the thermostat is adjusted as necessary.

4.2 Energy input rate is determined to confirm that the conveyor oven is operating within 5 % of the nameplate energy input rate. For gas conveyor oven, the pilot energy rate and the fan and control energy rates are also determined.

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[1] This test method is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.06 on Productivity and Energy Protocol.

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[2] Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329.

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